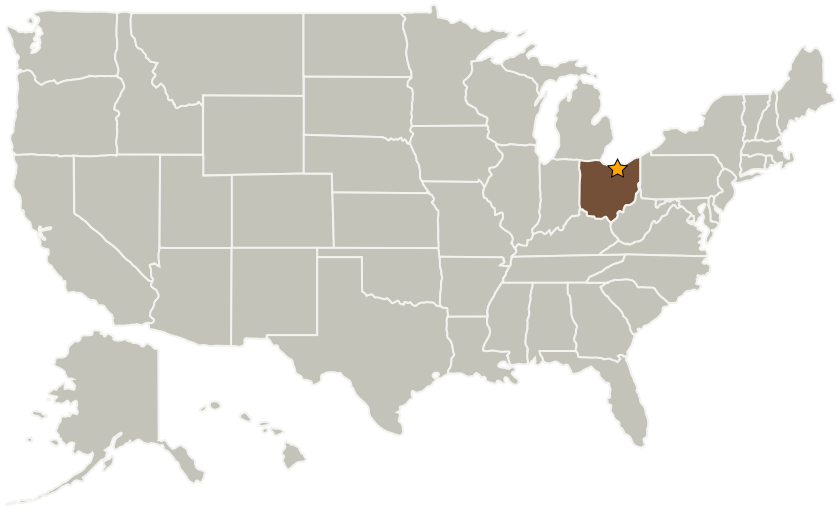
Milliwatt Radioisotope Stirling Convertor, Phase II

Completed Technology Project (2005 - 2007)

Project Introduction

Studies of potential space missions have highlighted the need for very small electric power supplies for a variety of applications. The light weight radioisotope heat unit (RHU) offers a long-life, reliable energy source for such systems which is independent of the surrounding environmental conditions, but a device is needed to convert radioisotope heat into electrical power. In Phase 1, Sest, Inc. investigated and fully defined a complete energy conversion system utilizing a very small Stirling-based convertor powered by a single RHU. It has conversion efficiencies greater than twice that of proposed thermoelectric convertors. Sest, Inc. proposes to complete the detailed design, fabricate, extensively test, and deliver to NASA a functional prototype of a Milliwatt Radioisotope Stirling Convertor (MRSC) system which will clearly demonstrate the performance characteristics of a low power Stirling-based conversion system. The reference MRSC system is designed to produce a net 100 mW or more of useful electrical power from a single RHU over an operating life of 10 years. The overall size of the prototype MRSC package is approximately 80 mm in diameter by 115 mm in length and has an estimated total mass of 250 g, for a specific power of 0.4 We/kg.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Sest, Inc.	Supporting Organization	Industry	Middleburg Heights, Ohio

Primary U.S. Work Locations
Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.3 Electrical Power Conversion and Regulation